

# The Wonders of Soil Growing a Healthy Lawn and Garden



City of Kirkland - Natural Yard Care



# The Value of Healthy Soil

- Reduces need for chemical fertilizers and pesticides
- Reduces irrigation needs
- Filters out urban pollutants
- Sequesters stormwater
- Stores carbon from atmosphere

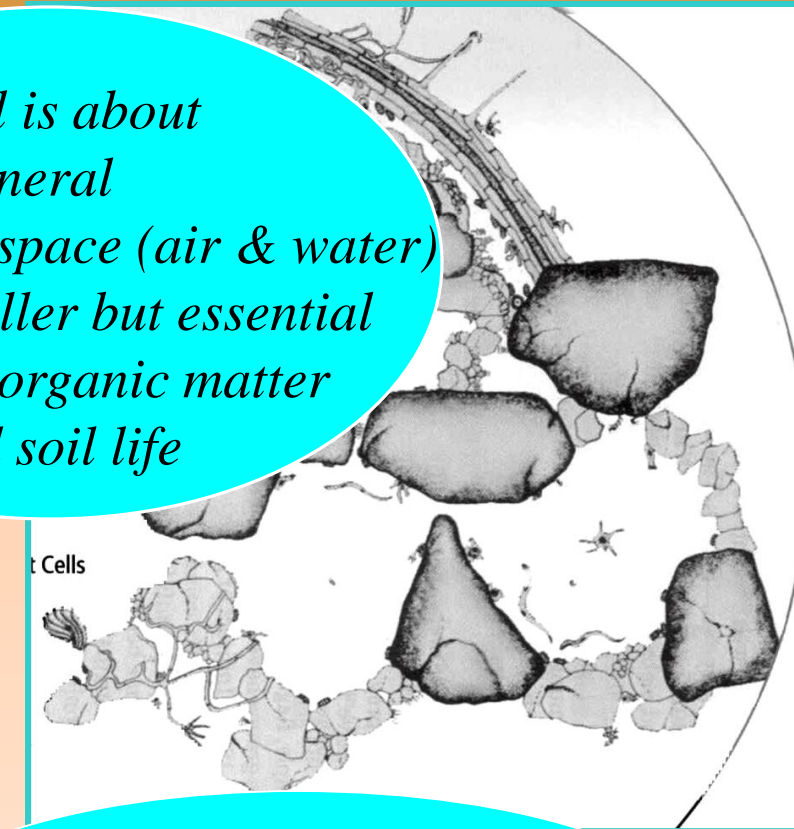


# Soil Components

## Soil Components

- **“The Dirt”**  
(mineral particles)
  - sand (0.05 to 2 mm)
  - silt (0.002 to 0.05 mm)
  - clay (<0.002 mm)
- **Air and Water** (in pore spaces)
- **Organic Matter and Soil Life**  
(create aggregates & pores)

*Good soil is about*  
*- half mineral*  
*- half pore space (air & water)*  
*- plus a smaller but essential*  
*amount of organic matter*  
*and soil life*

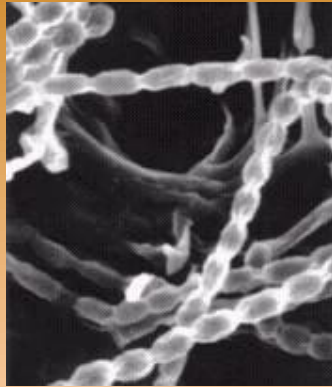


*“Loam” is a mix of*  
*sand, silt, clay and organic,*  
*formed over time by nature*

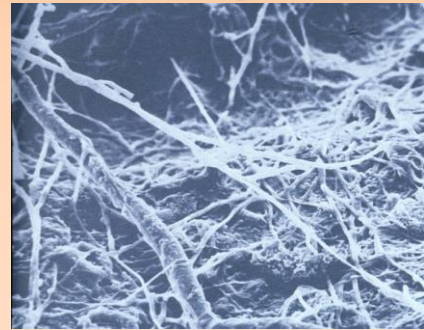


# Soil Foodweb

- **Bacteria**



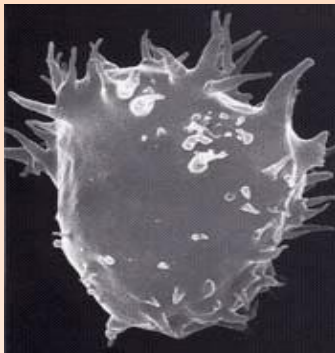
- **Fungi**



Soil Foodweb Inc.



- **Protozoa**



Wilhelm Foissner,  
University of Salzburg

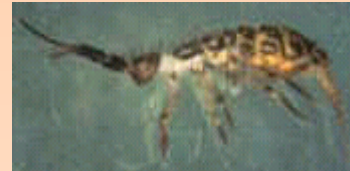
- **Nematodes**



Soil Foodweb Inc.



- **Arthropods**



SSSA



- **Earthworms**



# **Native Sub Soils in the Puget Sound Basin**

## **Land of Fire and Ice**

**Glacial Till**

**Hardpan**

**Outwash Soils**

**Lake/Marine Bed Soils**

**Volcanic Ash**

**Mudflows**



# Manufactured Soils

- Inputs are sourced from variable places
- Can come from construction sites
- Can have certified organic components
- Are not native soils
- Ask for testing information



# Soil Testing; A Good Tool

- Determine soil health baseline
- Assess nutrient quality
- Get guidelines for further amendments
- Assess toxin issues



## Toxin Concerns for Edible Gardening

- Houses built pre – 1978
- Old orchard grounds
- Industrial sites (old substations, auto shops)
- Downwind of cement plants
- Areas affected by Asarco Smelter plume
- Along a busy highway



# Soil Test

SEND TO: KING CONSERVATION DISTRICT  
1107 SW GRADY WAY STE 130  
RENTON, WA 98057

GROWER: O'GRADY

SUBMITTED BY: JAY MIRRO

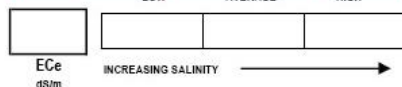
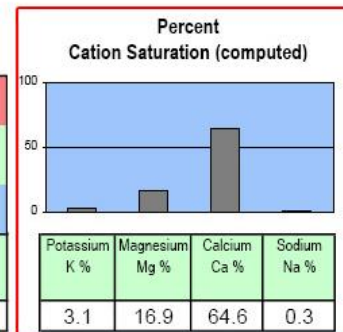
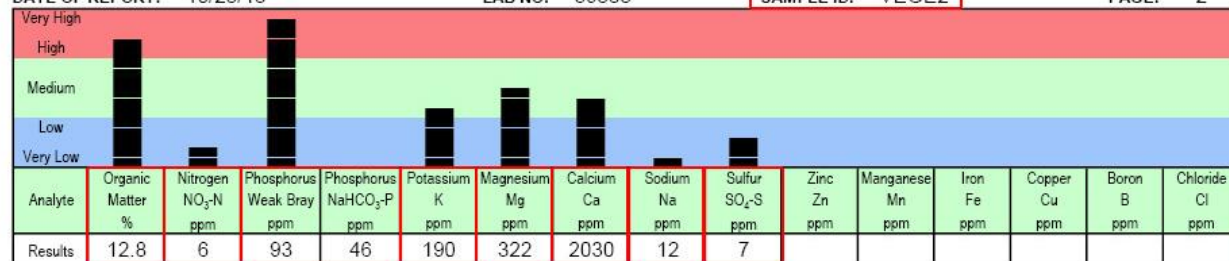
## Graphical Soil Analysis Report

DATE OF REPORT: 10/28/13

LAB NO: 59383

SAMPLE ID: VEGE2

PAGE: 2



NaHCO<sub>3</sub>-P unreliable at this soil pH

## Soil Fertility Guidelines

CROP: VEGETABLES

RATE: lb/1000 sq ft

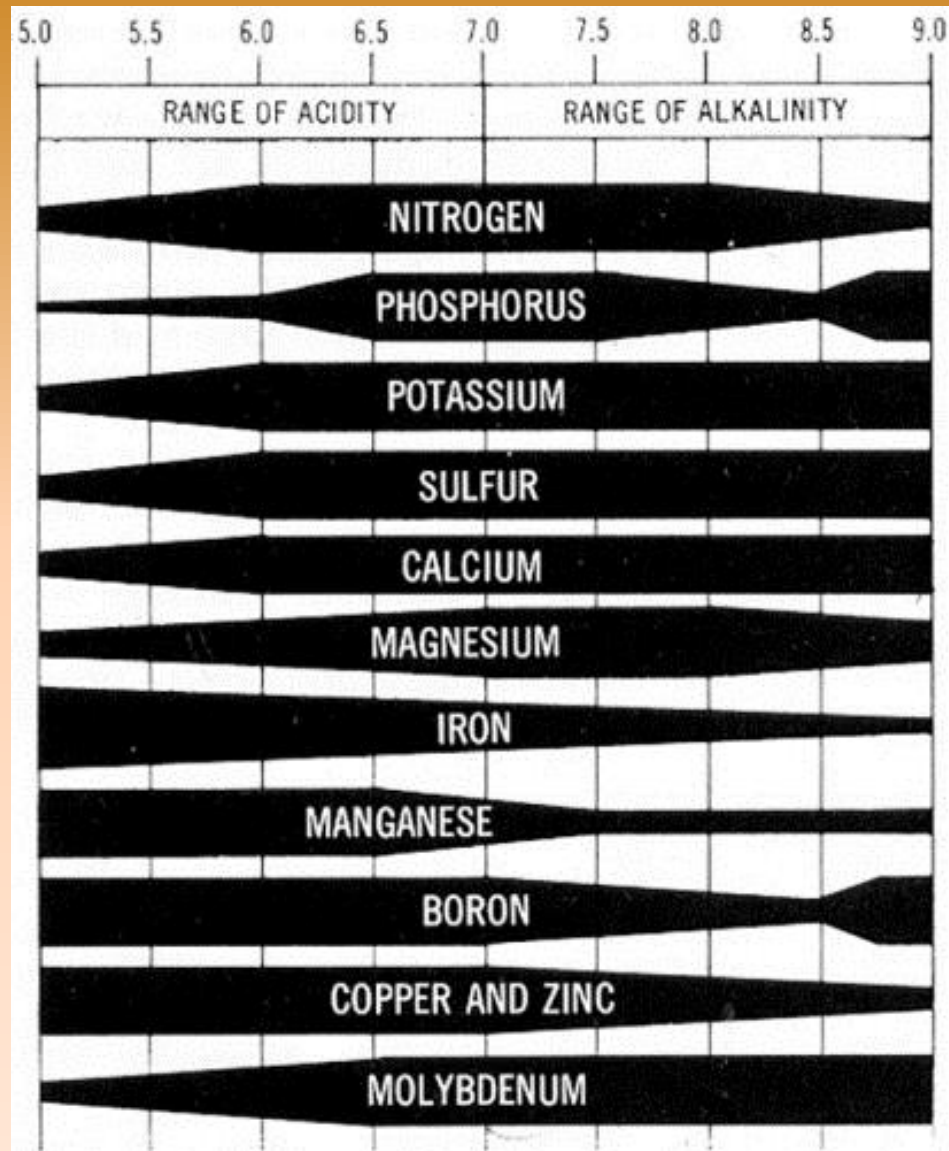
NOTES:

Dolomite 100 score	Lime 100 score	Gypsum	Elemental Sulfur	Nitrogen N	Phosphate P <sub>2</sub> O <sub>5</sub>	Potash K <sub>2</sub> O	Magnesium Mg	Sulfur SO <sub>4</sub> -S	Zinc Zn	Manganese Mn	Iron Fe	Copper Cu	Boron B
	180			3.3		3.0		0.6					

C  
O  
M  
M  
E



# pH and Nutrient Availability



# Amending Your Soil

- Yard or food waste compost – curbside or home composting
- Manure based compost – livestock and biosolids
- Growing cover crops

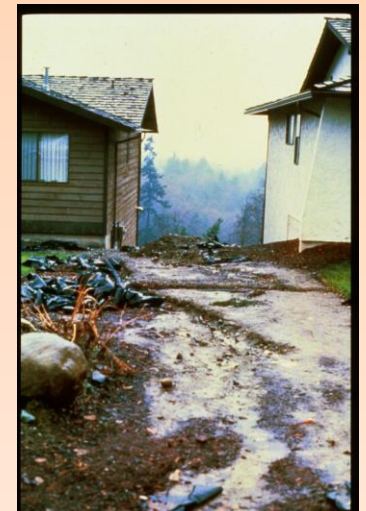




# Disturbed Soil and Compaction



- Topsoil layer removed
- Compaction
- Subsoil (or worse) used to fill layers
- Toxins





# Cover Crops Protect and Nourish Soil

- Protect from winter rain and leaching of nutrients
- Prevent compaction
- Add nitrogen
- Add organic matter
- Keep weeds at bay – sometimes inhibiting certain types of weeds



# Mulch Protects and Nourishes Soil

- Moisture conservation
- Prevents weeds
- Moderates soil temperature
- Makes a finished look
- Creates habitat for beneficial insects and birds



# Growing a Healthy Sustainable Lawn

- Mowing height – 2 inches minimum to outcompete weeds, shade soil, conserve moisture
- Grasscycle – reduces need for fertilization to one application in the fall
- Use natural, organic lawn fertilizer instead of chemical fertilizers
- No Phosphorus is allowed in lawn fertilizers unless your soil test shows P depletion – protects waterways





# Growing a Healthy Sustainable Lawn

- Apply lime in the fall if pH is low – check your soil test
- Lawns need 6-8 hours of sun – if too shady try alternatives
- Provide adequate water – 1 inch per week to 6 inch depth
- Good drainage matters—aerate and de- thatch and spread compost and reseed to keep them invigorated



# Lawns are...

- Many individual plants
- Grasses that like to grow tall
- Good competitors when healthy
- Permeable when healthy
- Hungry!
- Thirsty!



# Lawn and Seed Choices for NW Gardens

- Perennial Rye
- Perennial Fescue
- Kentucky Bluegrass
- Eco-Turf
- Native Grasses
- Steppable Groundcovers
- Perennial Clover



**Perennial Rye**



**Perennial Fescue**



**Steppables – Creeping Thyme**



**White Clover**



**Eco-Turf**



# Lawns in the Wrong Place

- **Slopes** - No more than 12% grade – avoid runoff, hard to mow – use groundcovers instead
- **Ponding** – Indicates compaction or high water table – assess for and correct or plant adapted plantings
- **Under Conifers** – Shade, tree roots, needles, ground water – substitute with shade loving perennials, ferns or groundcovers.
- **Shady Garden** – Lawns need 6 – 8 hours of sun daily Substitute with shade loving plants and natives.



# Weeds and Lawns

Weeds will outcompete lawn if conditions for healthy lawns are not met. Improve the health of your lawn to overcome weeds.

Corrective measures include:

- Mowing high – 2 inches to shade out weed seedlings
- Not letting weeds go to seed
- Aerating, de-thatching and topdressing -improve soil conditions
- Removing lawn from areas where it cannot thrive
- Tolerating some weeds – clover adds nitrogen to the soil





# Common Lawn Weeds

**Dandelion**



**Plantain**



**Buttercup**



**Moss**



**Cat's Ear**



**Clover**



**Sheep Sorrel**



**Self Heal**



**Some weeds are edible,  
others improve soil, many  
are companionable with  
lawns**



# Common Lawn Weeds

**Daisy**



**Yarrow**



**Ground Ivy**



**Annual Bluegrass**



**Speedwell**



**Tall Fescue**



# Common Lawn Pests

- Moles
  - ❖ Tunneling and hills – indicates your soil has life in it!
  - ❖ Stamp down hills and runs, tolerate until they go deeper into ground in summer
- Crane Fly
  - ❖ Creates bare patches in the soil
  - ❖ Indicates moist soil – correct or adapt, let lawn go golden in the summer, attract birds as predators, chickens and larvae, reduce pesticide use, apply nematodes as a bio-control
- Red Thread
  - ❖ Cosmetic damage mostly – indicates low nitrogen and wet soil
  - ❖ Mow off infected blades and fertilize
  - ❖ Prevent by keeping soil fertile and well drained



# Common Lawn Pests

**Mole hills**



**Crane Fly Damage**



**Red Thread in Active Stage**





# More Resources

- Garden Hotline – 206-633-0224 – [www.gardenhotline.org](http://www.gardenhotline.org)
- Tilth Alliance classes [www.tilthalliance.org](http://www.tilthalliance.org)
- *“Teaming With Microbes”* Jeff Lowenfels and Wayne Lewis
- *“Teaming With Nutrients”* Jeff Lowenfels
- *“Dirt: The Erosion of Civilizations”* David Montgomery

**Please join us next for:**

- ❖ **Smart Water Management for your Garden– April 30**
- ❖ **Benefitting from Beneficial Insects – May 7**